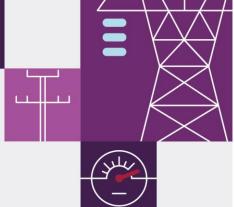# Guide to CDR APIs

V0.7 Draft 4 July 2022

Consumer Data Right

Information informing business analysts and IT staff in participant organisations

Important notice

Purpose

This Guide to CDR APIs, prepared by the Australian Energy Market Operator (AEMO), provides guidance for APIs implemented by AEMO for Consumer Data Right in accordance with the Consumer Data Standards.

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Version history

Draft Version 0.2

Updated to remove application specific error codes and describe handling of scenarios and to align with Data Standards decisions for Issue 448.

Draft Version 0.3

Updated Invalid Request Response for multiple NMI requests to reflect that errors will be returned for any NMIs that failed validation and no data will be provided.

Draft Version 0.4

getEnergyUsage APIs - Updated interval length in body to be number instead of string

Draft Version 0.5

Updated to remove duplicated information included under Consumer Data Standards and replace with links to standards. Corrected spelling of 'Authorization' header parameter. Added continuation-token query parameter. Aligned SDH API names to data standards.

Draft Version 0.6

Added CDR Rights Entity to section 2.2

Draft Version 0.7

Updated section 2 to specify IP Whitelisting not required for CDR, corrected API developer portal link

Documents made obsolete

The release of this document changes only the version of Guide to CDR APIs.

Feedback

Your feedback is important and helps us improve our services and products. To suggest improvements, please contact AEMO's Support Hub.

Contents

1 Introduction

1.1 Audience

AEMO provides this information to inform business analysts and IT staff in participant organisations.

- The primary audience is registered Electricity Retailers.

- The secondary audience is Accredited Data Recipients (ADRs), AEMO Operations and Technology teams.

1.2 Assumed reading and context

Consumer Data Standards are developed, maintained and owned by the Data Standards Body (DSB). Where there is any discrepancy between this guide and the Consumer Data Standards, the Consumer Data Standards take precedence.

As permitted under provisions for **Shared Responsibility Data Requests**, additional mandatory parameters have been specified within this guide for inclusion within API request headers to allow for AEMO security protocols.

The Consumer Data Standards are maintained here:
https://consumerdatastandardsaustralia.github.io/standards

This Guide assumes a working knowledge of the following documentation:

- Guide to AEMO's e-hub APIs. The latest version is maintained here:
  https://aemo.com.au/en/energy-systems/market-it-systems/electricity-system-guides/participant-it-interfaces.

1.3 Assumed knowledge

This guide assumes you have knowledge of:

- RESTful programming architecture;

- The Consumer Data Standards maintained by the Data Standards Body (DSB):
  https://consumerdatastandardsaustralia.github.io/standards/

1.4   Schedule

Scheduled for implementation in:

- Pre-production**:** Staged release, July - August 2022

- Production: November 2022

2   CDR APIs – Standards

This section provides a high-level overview of the CDR APIs that **retailers** can use to request standing data, meter data and distributed energy resource (DER) data for the purpose of fulfilling data requests from ADRs.

2.1   API Access

- AEMO's CDR APIs are exposed through the internet and MarketNet via an API gateway.

- API details, including Swagger files are available via AEMO's API Portal, **https://developer-portal-prd.aemo.com.au**.

- Participants must be registered with AEMO to use CDR APIs. For help, see **Guide to AEMO's e-Hub APIs.**

- IP whitelisting is <u>not</u> required for CDR APIs.

2.2   API Authentication and Authorisation

Authentication

- All communications between AEMO's API gateway and participants' gateways use **HTTPS**. HTTP is not supported.

> For details on the steps to obtain a certificate, see **Guide to AEMO's e-Hub APIs**.

- API connections use mTLS certificates to secure the transport layer with encrypted communication and secure interactions between participants' and AEMO's systems.

- AEMO issues mTLS certificates to participants on request.

Authorisation

- API calls for retailers are authorised by Basic HTTP authentication using a username and password assigned by the company's Participant administrator.

- Read access to the entity '**CDR – Energy API access**' must be added to the rights assigned to the user account that you will use to call the CDR APIs.

- For more information about user rights including creating new Participant Users and assigning rights, refer to the document **Guide to User Rights Management (URM)**.

2.3   API format

The CDR API URL design follow's the format specified by the Consumer Data Standards. You can access the CDR APIs via the public internet or via MarketNet. CDR API endpoints will have the following format:

<environment base URL>/NEMRetail/cds-au/<standards version>/secondary/energy/<resource>

Environment	Internet Address
Pre-production base URL	
Internet web service host	**https://apis.preprod.aemo.com.au:9319**
MarketNet web service host	**https://apis.preprod.marketnet.net.au:9319**
Production base URL	
Internet web service host	**https://apis.prod.aemo.com.au:9319**
MarketNet web service host	**https://apis.prod.marketnet.net.au:9319**

2.3.1   API naming

The CDR APIs follow the naming conventions as defined by the Consumer Data Standards body.

2.4   Payload compression

AEMO APIs support HTTP protocol compression controlled by the HTTP request header attributes, allowing compression before sending and responding. For more information, refer to Content-Encoding and Accept-Encoding in the next section.

2.5 Request headers

AEMO requires the following header parameters be included in requests <u>in addition to</u> request header parameters specified by the Consumer Data Standards under Energy Secondary Data Holder APIs (**https://consumerdatastandardsaustralia.github.io/standards/#energy-secondary-dh-apis**).

Parameter	value(s)	description
Accept-Encoding	gzip compress deflate	Specifies the encoding support for the response. **This is mandatory for Get Usage for Service Point and Get Usage for Specific Service Points.**
X-initiatingParticipantId	<PID>	The participant ID who the request is from. **This is mandatory.**
Authorization	Basic	Base64 encoding of the URM username and password, concatenated with a colon. **This is mandatory.**

2.6   Query Parameters

Refer to the Consumer Data Standards / Energy Secondary DH APIs for request parameters for each API **(https://consumerdatastandardsaustralia.github.io/standards/#energy-secondary-dh-apis).**

2.6.1   Pagination query parameters

In addition to query parameters as defined by the Consumer Data Standards to support pagination of results, as permitted under **Cursor Support**, AEMO will include the below query parameter within URIs returned for page links.

Parameter	value(s)	description
continuation-token	string	Token included within page links to uniquely identify the results relating to a request. Example URI with continuation-token: <base URL>/NEMRetail/cds-au/v1/secondary/energy/electricity/servicepoints?page=2&page-size=2&continuation-token=0fae153682b8ef7eef408eb89083a07db7c8c777

2.7 List of AEMO CDR APIs

This section describes the Energy Secondary Data Holder APIs supported by AEMO to request Consumer Data.

API Name	Supported Method	Entity Description
Get Service Point Detail (SR)	GET	Request current detailed standing data for a single NMI. **https://consumerdatastandardsaustralia.github.io/standards/#get-service-point-detail-sr**
Get Service Points (SR)	POST	Request current high-level details for a list of NMIs. **https://consumerdatastandardsaustralia.github.io/standards/#get-service-points-sr**
Get Usage For Service Point (SR)	GET	Request meter data for a single NMI for up to 24 months. **https://consumerdatastandardsaustralia.github.io/standards/#get-usage-for-service-point-sr**
Get Usage For Specific Service Points (SR)	POST	Request meter data for a list of NMIs for up to 24 months. **https://consumerdatastandardsaustralia.github.io/standards/#get-usage-for-specific-service-points-sr**
Get DER For Service Point (SR)	GET	Request distributed energy resource information for a single NMI. **https://consumerdatastandardsaustralia.github.io/standards/#get-der-for-service-point-sr**
Get DER For Specific ServicePoints (SR)	POST	Request distributed energy resource information for a list of NMIs. **https://consumerdatastandardsaustralia.github.io/standards/#get-der-for-specific-service-points-sr**

2.8 POST API response compression

CDR POST APIs should have a compressed payload.

Parameter	Value(s)
Content-Type	Must be: application/json
Content-Encoding	Should be at least one of: gzip compress deflate **If not provided no compression is assumed.**
Accept-Encoding	Should be at least one of: gzip compress deflate **If not provided no compression is assumed.**

2.9   GET API response compression

CDR GET APIs provide a compressed successful response.

Parameter	Value(s)
Content-Type	Must be: application/json
Content-Encoding	Should be at least one of: gzip compress deflate **If not provided no compression is assumed.**

2.10 Throttling

AEMO implements throttling on API calls. Throttling is set at:

- 3600 requests per participant per minute.

2.11 Response Codes

The Consumer Data Standards Body (DSB) defines error response codes for CDR. Response codes are managed by the DSB **here**. Refer to section 3.9 Validation Rules for further information on validation errors that may be returned.

2.12 Invalid Request Responses

Item	Value(s)
HTTP Response Code(s)	For possible HTTP response codes which may be returned for GET or POST requests, refer to: **https://consumerdatastandardsaustralia.github.io/standards/#http-response-codes**
Body	Where a request is deemed invalid, the body of the response will contain the Errors object as defined by the Consumer Data Standards. **https://consumerdatastandardsaustralia.github.io/standards/#error-codes**

2.13 Performance Requirements

Performance requirements will be as per **https://consumerdatastandardsaustralia.github.io/standards/#performance-requirements** for secondary requests

3 CDR API Specifications

3.1 Design

As per the Consumer Data Standards, request and response data payloads are to be provided in a JSON format.

Retailers must validate requests from ADRs and determine entitlement to data before calling the AEMO equivalent API to obtain data to fulfil the request. Only requests successfully authenticated and authorised via retailers are to result in a call to AEMO's CDR APIs.

3.2 Get Service Point Detail (SR)

3.2.1 Consumer Data Standards Reference

Specifications for the Get Service Point Detail (SR) API are maintained here:
https://consumerdatastandardsaustralia.github.io/standards/#get-service-point-detail-sr

3.2.2 Description

Retailers can request current and detailed standing data for a single NMI for which they are the current FRMP. Data returned includes NMI, address, participant, meter and register details.

3.2.3 Request

Item	Value(s)
URL Path	<base_url>/electricity/servicepoints/{servicePointId}
Method	GET
Header	As per 2.5 Request headers
Query Parameters	Not applicable
Body	Not applicable

3.2.4 Valid Request Response

Where successful, the Get Service Point Detail (SR) API response payload will be as per the EnergyServicePointDetail schema defined by the Consumer Data Standards.

https://consumerdatastandardsaustralia.github.io/standards/#schemacdr-energy-secondary-data-holder-apienergyservicepointdetail

In addition to Response Headers specified for the Get Service Point Detail (SR) API, the following will be returned:

- Content-Encoding: As requested [gzip, compress, deflate].

Note: only included in the response if Accept-Encoding was included on the request.

3.4　Get Service Points (SR)

3.4.1　Consumer Data Standards Reference

Specifications for the Get Service Points (SR) API are maintained here:

https://consumerdatastandardsaustralia.github.io/standards/#get-service-points-sr

3.4.2　Description

Retailers can request current high level standing data for multiple NMIs for which they are the current FRMP. Data returned is limited to high level NMI details, i.e. no meter, register, participant, address information is returned.

3.4.3　Request

Item	Value(s)
URL Path	//electricity/servicepoints/
Method	POST
Header	As per 2.5 Request headers
Query Parameters	Accepted query parameters will be as per **https://consumerdatastandardsaustralia.github.io/standards/#get-service-points-sr** and 2.6.1 Pagination query parameters
Body	The body of the request will be as per **https://consumerdatastandardsaustralia.github.io/standards/#get-service-points-sr**

3.4.4　Valid Request Response

Where successful, the Get Service Points (SR) API response payload will be as per the EnergyServicePointListResponse schema defined by the Consumer Data Standards.

https://consumerdatastandardsaustralia.github.io/standards/#tocSenergyservicepointlistresponse

In addition to Response Headers specified for the Get Service Points (SR) API, the following will be returned:

- Content-Encoding: As requested [gzip, compress, deflate]. Note: only included in the response if Accept-Encoding was included on the request.

3.5 Get Usage For Service Point (SR)

3.5.1 Consumer Data Standards Reference

Specifications for the Get Usage For Service Point (SR) API are maintained here:
https://consumerdatastandardsaustralia.github.io/standards/#get-usage-for-service-point-sr

3.5.2 Description

Retailers, on behalf of ADRs, can request usage data for a NMI for up to 24 months in the past for periods where they are the registered FRMP.

All available meter data for periods within the requested date range where the requesting participant is the registered FRMP will be returned. Where no data is available an empty array will be returned.

3.5.3 Request

Item	Value(s)
URL Path	//electricity/servicepoints/{servicePointId}/usage
Method	GET
Header	As per 2.5 Request headers
Query Parameters	Accepted query parameters will be as per **https://consumerdatastandardsaustralia.github.io/standards/#get-usage-for-service-point-sr** and 2.6.1 Pagination query parameters
Body	NA

3.5.4 Valid Request Response

Where successful, the Get Usage For Service Point (SR) API response payload will be as per the EnergyUsageRead schema defined by the Consumer Data Standards.

https://consumerdatastandardsaustralia.github.io/standards/#schemacdr-energy-secondary-data-holder-apienergyusageread

In addition to Response Headers specified for the Get Usage For Service Point (SR) API, the following will be returned:

- Content-Encoding: As requested [gzip, compress, deflate].

Note: only included in the response if Accept-Encoding was included on the request.

3.6 Get Usage For Specific Service Points (SR)

3.6.1 Consumer Data Standards Reference

Specifications for the Get Usage For Specific Service Points (SR) API are maintained here: **https://consumerdatastandardsaustralia.github.io/standards/#get-usage-for-specific-service-points-sr**

3.6.2 Description

Retailers, on behalf of ADRs, can request usage data for multiple NMIs for a date range of up to 24 months in the past where they are the registered FRMP.

All available meter data for periods within the requested date range where the requesting participant is the registered FRMP will be returned. Where no data is available based on this criteria, an empty data payload will be returned.

3.6.3 Request

Item	Value(s)
URL Path	//electricity/servicepoints/usage
Method	POST
Header	As per 2.5 Request headers
Query Parameters	Accepted query parameters will be as per **https://consumerdatastandardsaustralia.github.io/standards/#get-usage-for-specific-service-points-sr** and 2.6.1 Pagination query parameters
Body	The body of the request will be as per **https://consumerdatastandardsaustralia.github.io/standards/#get-usage-for-specific-service-points-sr**

3.6.4 Valid Request Response

Where successful, the Get Usage For Specific Service Points (SR) API response payload will be as per the EnergyUsageListResponse schema defined by the Consumer Data Standards.

**https://consumerdatastandardsaustralia.github.io/standards/#tocSenergyusagelistrespo
nse**

In addition to Response Headers specified for the Get Usage For Specific Service Points (SR)
API, the following will be returned:

- Content-Encoding: As requested [gzip, compress, deflate]. Note: only included in the
  response if Accept-Encoding was included on the request.

3.7   Get DER For Service Point (SR)

3.7.1   Consumer Data Standards Reference

Specifications for the Get DER For Service Point (SR) API are maintained here:
https://consumerdatastandardsaustralia.github.io/standards/#get-der-for-service-point-sr

3.7.2   Description

Retailers, on behalf of ADRs, can request Distributed Energy Resource information for a
service point where they are the current FRMP.

3.7.3   Request

Item	Value(s)
URL Path	//electricity/servicepoints/{servicePointId}/der
Method	GET
Header	As per 2.5 Request headers
Query Parameters	Accepted query parameters will be as per **https://consumerdatastandardsaustralia.github.io/standards/#get-der-for-service-point-sr**
Body	NA

3.7.4 Valid Request Response

Where successful, the Get DER For Service Point (SR) API response payload will be as per the EnergyDerRecord schema defined by the Consumer Data Standards.

https://consumerdatastandardsaustralia.github.io/standards/#schemacdr-energy-secondary-data-holder-apienergyderrecord

In addition to Response Headers specified for the Get DER For Service Point (SR) API, the following will be returned:

- Content-Encoding: As requested [gzip, compress, deflate]. Note: only included in the response if Accept-Encoding was included on the request.

3.8   Get DER For Specific Service Points (SR)

3.8.1   Consumer Data Standards Reference

Specifications for the Get DER For Specific Service Points (SR) API are maintained here:
https://consumerdatastandardsaustralia.github.io/standards/#get-der-for-specific-service-points-sr

3.8.2   Description

Retailers, on behalf of ADRs, can request Distributed Energy Resource information for a list of NMIs for which they are the current FRMP.

3.8.3   Request

Item	Value(s)
URL Path	//electricity/servicepoints/der
Method	POST
Header	As per 2.5 Request headers
Query Parameters	Accepted query parameters will be as per **https://consumerdatastandardsaustralia.github.io/standards/#get-der-for-specific-service-points-sr** and 2.6.1 Pagination query parameters
Body	The body of the request will be as per **https://consumerdatastandardsaustralia.github.io/standards/#get-der-for-specific-service-points-sr**

3.8.4   Valid Request Response

Where successful, the Get DER For Specific Service Points (SR) API response payload will be as per the EnergyDerListResponse schema defined by the Consumer Data Standards.

https://consumerdatastandardsaustralia.github.io/standards/#tocSenergyderlistresponse.

In addition to Response Headers specified for the Get DER For Specific Service Points (SR) API, the following will be returned:

- Content-Encoding: As requested [gzip, compress, deflate]. Note: only included in the response if Accept-Encoding was included on the request.

3.9   Validation Rules

The following validations will be applied by AEMO where a properly formed and authenticated API request is received.

Business Rule	APIs applied against	Error Details
NMI must exist in MSATS	All CDR Shared Responsibility (SR) APIs	HTTP Response Code: - 404 Not Found : if NMI forms part of URI - 422 Unprocessible Entity : if NMI included in body Standards Error Code: urn:au-cds:error:cds-energy:Authorisation/InvalidServicePoint Title: Invalid Service Point Detail: \<NMI\>
Must be the current registered FRMP	Get Service Point Detail (SR) Get Service Points (SR) Get Der For Service Point (SR) Get Der For Specific Service Points (SR)	HTTP Response Code: - 404 Not Found : if NMI forms part of URI - 422 Unprocessible Entity : if NMI included in body Standards Error Code: urn:au-cds:error:cds-energy:Authorisation/InvalidServicePoint Title: Invalid Service Point Detail: \<NMI\>

4   Glossary

Term	Explanation
ADR	Accredited data recipient
AEMO	Australian Energy Market Operator
CDR	Consumer Data Right
DER	Distributed Energy Resource
DSB	Data Standards Body
FRMP	Financially Responsible Market Participant (the registered retailer in MSATS for a NMI)
MSATS	Market Settlement and Transfer Solution for Electricity
NMI	National Metering Identifier
Service Point	NMI / connection point / supply point
servicePointId	A unique identifier assigned to a service point for communications between the ADR and retailer. For all API requests to AEMO, the retailer must replace the service point ID value with the NationalMeteringIdentifier (NMI)
Shared Responsibility / SR	API types where data is to be provisioned by a secondary data holder.